

under proper conditions preparatory to the hypnoid state. Suggestions of perfect health and disregarding of quasi-symptoms returned this man to uninterrupted work, and in the last two years quacks have not received any of his hard-earned money.

This case is a typical one, from a large number of observations among ignorant foreigners. The quacks, driven from the columns of our leading papers, concentrate their efforts in obscure foreign sheets, where, hidden from discovery by the proper authorities, they publish most shameless stuff, and find easy victims amongst the absolutely inexperienced, friendless and ignorant foreigners. I have observed several cases where some of these victims were made absolutely useless and helpless and have ended in the poorhouse, the insane asylum or other charitable institutions; some having been sent home by means of collections among their more fortunate countrymen.

Case 6. An instructor in one of our leading educational institutions consulted me and confessed to what he called an obsession, an irresistible desire to spank and whip well-dressed young girls. There was never any desire to do any real harm, but the case was plainly a mild form of Sadism. Some years ago he had to quit under a cloud a high-school position, and was at that time accused of brutality and abuse of authority, his case not having been properly interpreted by his accusers and he naturally preferring to hide his infirmity. Psycho-analysis brought out a suppressed emotion dating back to the patient's childhood, and suggestion in the hypnoid state freed him completely of his perverse craving. He returned to his duties without the former constant dread of the penitentiary.

Case 7. A frail and dainty little French woman, 30 years of age, was, when nursing her only child, infected by her husband with syphilis. She in turn infected the child. The whole family was treated in Paris with intramuscular injections of benzoate of mercury for a long period, and neither mother nor child presented any symptoms when examined five years after the primary infection. She complained of a strange desire to harm or even to kill her daughter, whenever she was left alone with her. Though the woman was always able to suppress this unnatural desire she was afraid that a time might come when she would not be able to resist that impulse, and might do harm to the little girl whom she loved to distraction. On the verge of committing suicide, she consulted me in 1907. Psycho-analysis explained the underlying cause. When first informed of the character of the disease with which she had innocently infected her child, the idea came suddenly that the child would be better dead, but this idea was suppressed at once. Easily and repeatedly the patient was placed in the hypnoid state, and the suggestion that her child is now well and ought to live and grow was impressed upon her mind. When last seen early this year the woman declared she could not understand how she ever could have had any such foolish desire.

PHOTOGRAPHY IN RELATION TO THE MEDICAL SCIENCES.*

By H. D'ARCY POWER, M. D., San Francisco.

It is remarkable how in an age when everybody writes, and the most trivial subjects receive more than their share of attention, it still occurs that matters of great and practical importance are without an available literature. Such is the case in respect to the technics of photography when applied to the needs of the physician and surgeon. Every medical publication throughout the

world is more or less photographically illustrated but we all are painfully aware how commonly these pictures fail to convey the author's conception.

For many years, photography, both as an art and a science, has occupied most of my leisure time, and for the last fifteen years, I have constantly used it, as a matter of routine, in my medical practice for purposes of record and investigation. The technical knowledge I have thus gained has always been at the service of my colleagues, and the increasing frequency with which it has been called into requisition leads me to believe that a short description of important points may be welcome to those using the camera, whilst a knowledge of its many fields of value in medical practice may lead others to acquire facility in its use. To provide full instruction to the uninitiated would demand your attention over a course of lectures. I must therefore assume a general photographic knowledge on your part.

There are four specific fields of medical photography to which I invite your attention:

1. Clinical Recording and Illustration.
2. Photomicrography.
3. Radiography.
4. Kinematography.

My remarks will apply chiefly to the first and second—in which my experience is greatest.

Clinical Records.—It is of the greatest importance, both to our patients and ourselves, that the physical condition of the former be accurately recorded at the beginning of, and during, treatment. However naturally good and well trained our memories, the ever shifting picture of physical change, often extended over long periods of time, is rarely retained in our minds with accuracy, and our beliefs are more often the product of "Einbildung" than "Vorstellungskraft."

The best of anamnesis, aided by diagrams, fails in depicting facial expression; and descriptions of skin texture, vascular turgidity, general malnutrition, etc., are only approximations, dependent on the literary skill of the recorder. Lastly be it noted that only a small proportion of men in general practice keep serviceable records of any kind. It is to the betterment of these conditions that I advocate the use of photography.

In making a photograph there are certain requirements to be fulfilled wherein, if there be failure, the resulting picture will be useless or even misleading. We must secure

1. Correct drawing
2. Correct texture
3. Correct Scale
4. Uniformity of view point.

It may be said that the lens always draws correctly. This is only true if the lens be correctly placed. If there be any lack of parallelism between the planes of the picture and that of the lens, the drawing will be proportionately false. Correct drawing in normal perspective is only obtained when the camera stands on a level base opposite the centre of the object to be photographed. This requirement must be strictly maintained when the object photographed occupies the

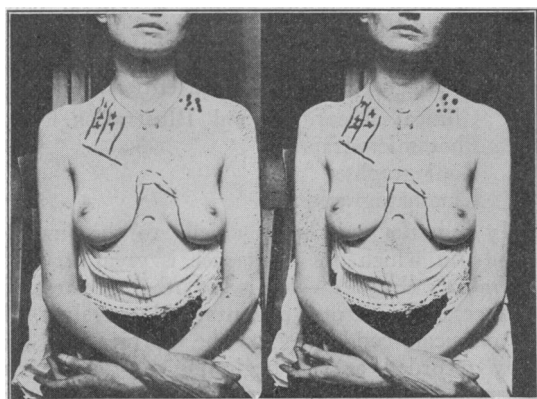
* Read at the Forty-fourth Annual Meeting of the Medical Society, State of California, Santa Barbara, April, 1914.

greater part of the visual (lens) field, but in the case of small objects, such as skin lesions, it is of minor importance. Many photographs published in books and journals err greatly in this matter.

Correct texture. The production of texture is the glory of photography. No other process can approach it in accuracy, leaving out facility, but the majority of photographic reproductions in books and journals are very defective. Success is a matter of lighting and development, and will be dealt with under those headings.

Uniformity of view point is essential if successive photographs are to be compared; this means that conditions must be standardized in place of the usual happy-go-lucky way in which photographs are taken.

I will now offer a few practical suggestions:



Pulmonary Tuberculosis.
 ///=Increased Conduction.
 xx=Crepitus.
 ...=Dullness.

Example of Clinical Record—Scale 1/10th.

Clinical Photographs.—I wish here to plead for the photograph as the routine method for keeping records. If a photograph can be taken in less than five minutes, and is capable of giving you a record of the patient's physique, of facial expression, skin texture, anatomical changes, and such internal conditions as the physician can depict by marks on the surface; and further, if such a photograph can be compared with others taken subsequently, with the power of accurately measuring interim changes, then this photograph is not only a better recorder of facts, but a great economizer of time. And this is undoubtedly the case. I have for years so kept my own records, and be the case one of lung, heart or abdominal disease, it is my habit to depict on the skin surface with brush or pencil by arbitrary signs the results of my examination. Thus, in lung disease, I indicate dullness by dots closely or widely placed, crepitus by crosses, large or small, increased sound conduction by lines. The resulting photograph is a much more useful record than the regulation printed diagram.

I will now briefly describe the essential points in the technic. These will equally apply to photographs of surgical procedures and of pathologi-

cal specimens. In all cases we must secure the following results:

1. Accurate drawing.
2. Perfect texture.
3. Correct scale throughout.

Accurate drawing is dependent on a correct relation of the camera to subject. The greater number of the photographs that I see taken by medical men show incorrect drawing from failure to correctly place object and camera. The essential requirement is that the plane of the lens and that of the object shall be parallel to one another. If the object is to be taken from above, the camera must be suspended above it; if vertical, the camera likewise. The average photograph, such as the surface of chest or abdomen, is best taken by resting the camera on a flat surface such as the table, or on a camera stand with a fixed base. The centre of the lens should be opposite the centre of the area to be photographed. If the plane recede, then the camera should be tipped to an equal angle. Probably the most difficult matter is to so place the object, or part of the body, that the same position can easily be repeated on a future occasion. For the whole body this is comparatively easy. The patient should stand against the wall, with heels and occiput in contact. This will necessitate the shoulders being thrown out.

The abdomen is preferably taken in the same posture, but for tumors, the body should be on the back and the camera supported above the patient.

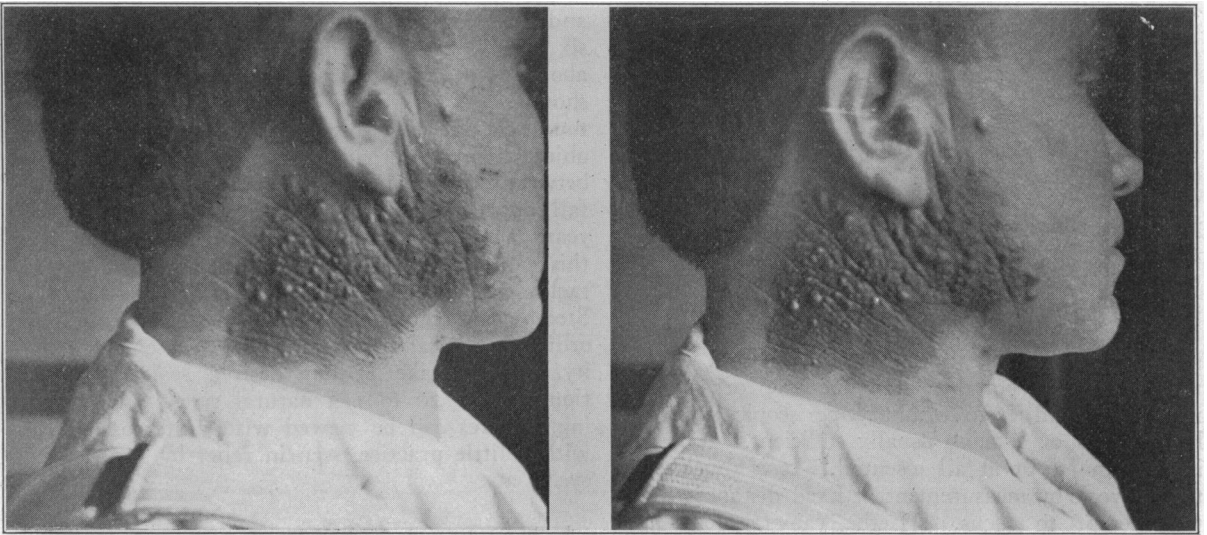
The thorax can well be taken with the patient sitting in a chair. This is my own daily practice. Care is needed that the spine is held rigid, that the shoulders are at the same level and the arms parallel. The position of the head should be such that the ears are equally visible on either side, and the root of the nose on a level with the lobes of the ears. Though this may give slightly altered relations between different individuals, it secures equality of position in succeeding photographs of the same. Photographs to show pathologic conditions of the extremities are difficult and the position must be determined by the peculiarities of the case. For the hands a piece of (corrugated) pasteboard placed in front of the chest on which the hands are extended affords one of the most satisfactory and simply attained arrangements.

Finally, we must remember that with moving surfaces, such as those of the chest and abdomen, the drawing will vary with the phase of respiration. Therefore the practice of always exposing at a given stage should be adopted. My rule is to call for three deep respirations, then stop the patient midway in expiration and direct the breath to be held during the exposure.

Modeling and Texture. Lighting.—While drawing is chiefly dependent on posture, texture and surface relief are chiefly a matter of illumination. Principles, not rules, are our only guides here. Surface relief is dependent on the formation of shadows. A considerable elevation of the chest or abdomen will entirely fail to show on a photograph if the light falls on it at right angles, so

that no shadow is formed. It may, on the other hand, be greatly exaggerated by a too oblique illumination and the only rule is so to place the patient in reference to the light that the desired effect is plainly visible on the ground glass, or to the eye of the worker when viewed from a position near the lens. Sharpness of texture is not only a matter of direction of light, but also of diffusion; the nearer the source of illumination approaches a point the better will texture be represented. For this reason, I am much in favor of the use of flashlight for photographs, such as those of skin, in which texture is the main consideration. Furthermore, the use of flashlight permits of photographs of moving surfaces, such

employ a small camera— $4\frac{1}{2}$ by $3\frac{1}{2}$ inches. On the ground glass a six foot man would occupy 3 inches at a reduction of $\frac{1}{20}$ th. The thorax, abdomen or head can be taken at $\frac{1}{5}$ th, or better, $\frac{1}{6}$ th, and skin texture, small tumors, tongue, eyes, etc., at $\frac{1}{4}$ th. Place on a well lighted wall a three foot flat rule. Set up the camera in front of it and move it until the image of the rod in sharp focus occupies $1\frac{1}{2}$ inches on the ground glass. Mark on the base-board the position of the camera. Measure the distance between the camera and the rod and inscribe this beside the mark on the base-board. Now approach the rod until its image covers 3 inches in focus. Again mark base-board and measure and inscribe dis-



Stereoscopy in Skin Disease.
Scale $\frac{1}{4}$.

as the tongue. With the enclosed flash, such as that of the Victor apparatus and others, it is possible to use the apparatus without causing any smoke in the office or ward.

Scale.—In the use of photography for scientific purposes, no point is more important than the provision for accurate measurement of the parts depicted. There are two ways of obtaining this result. One is to take the whole picture at a given scale of reduction; the other is to include a measuring rod or tape in the group by reference to which the size of parts may be determined. As usually employed, both methods frequently fail in accuracy. In the first case, with a short focus lens used at a short distance from an object such as the human body, the far and near planes depart considerably from the standard of reduction, which must necessarily have been determined for a flat surface. By the second method, truth is only obtained by applying the image of the measure to the plane of the surface on which it is lying. Also, I would note that the common practice of using the regulation tape measure gives an image that is frequently illegible. The following method will give good general accuracy and provide for the correction of any secondary error. First, arrange the camera to take at four scales of reduction. These will depend on the size of camera used. I

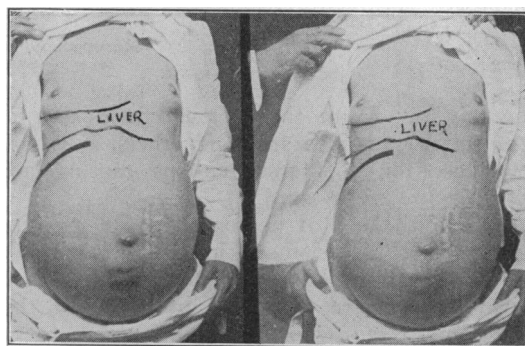
tance of rod from camera. Repeat this procedure so that 18 inches on the rod occupies 3 inches on the ground glass, and lastly that 12 inches occupies the same. When the base-board has been marked and the distances recorded, we are saved all future focusing troubles—and these are among the commoner causes of failure—and our images will in a general way be true to the chosen scale. Only in the case of the larger images, the $\frac{1}{6}$ th and $\frac{1}{4}$ th, it may happen that if the image is that of a receding plane such as the thorax, a difference of scale between the near and far planes will appear. If only one of these is required in the record, we simply measure our distance from the lens to the desired surface and that will then be in true measure. But if the record is to include both far and near planes, we must take our measure to a point $\frac{1}{3}$ behind the front plane and secure depth of focus by stopping down the lens. The resulting picture will look correct but will measure too much in the near plane and too little in the distant one. Usually the error is trifling, but its correction is very simply provided for. If a strip of 1 inch surgical plaster be stuck on the body in the direction of the receding plane, the variation in the width of its image will provide the means of correcting any error due to perspective. And here let me say that those who do not

care to fix their cameras for definite reductions can always insure a means of correct measurement by the use of surgical plaster. It is cut by machinery to accurate width. A piece of known width stuck on the surface to be photographed provides a sure scale. Personally, I keep in my card case a few pieces of lantern slide binding, cut to 4 inches (10 cm.) long. It is $\frac{1}{2}$ inch wide and very black. It always photographs distinctly and is most useful.

General Technics.—I wish to conclude this paper by a few remarks on camera, plates, and papers. It is an entire mistake to imagine that expensive apparatus is essential or even valuable in medical photography. The little Brownie Stereo camera, costing only a few dollars, whose lenses from the opticians' viewpoint are very defective, is responsible for nearly all the photographs, stereograms, and lantern slides I have exhibited. The fact is that in order to get the depth of focus we need, we are compelled to work with short focus lenses at small aperture, and under such conditions any kind of a lens will give sharp definition. There are just two conditions really essential. The camera should be strong and capable of enough extension to work at a scale of reduction of $\frac{1}{4}$ the actual size. Many useful cheap cameras fail in this latter respect but can be so used by the use of a supplemental lens. Such lenses are sold under the name of "portrait attachments", or can be readily ground from ordinary periscopic spectacle lenses, +1 or 2 being usually sufficient. A focusing screen is not at all essential. It is much better to work by measurement at fixed distances than to attempt to focus. If the camera does not possess a focusing screen it will be necessary to remove the back and place a piece of ground glass in its place while making the observations previously described. All plate cameras have, however, a focusing screen, and I strongly advise the use of plates in preference to films. There are several reasons for this. Plates are easier to handle, they can be obtained in various grades and with special qualities. Thus, much of the material we photograph is yellow or reddish in tint. The ordinary plate is quite insensitive to these colors, and the plate should be either an ortho or panchromatic plate, which is specially sensitized. It is also desirable to use what are known as double coated plates. I use the "Isonon" which is yellow sensitive and double coated. It is best used with a four time color screen, which cuts out the excess of blue rays. In development the object should be to obtain good detail and avoid unnatural contrasts. This is best attained by full exposure and development with a rather weak developer. I use Rodinal, which is the simplest of all preparations to employ. Prints are best made on Glossy Bromide Paper, which is not so contrasty as the gaslight varieties. There is a current superstition that prints for half-tone reproduction must be made on "Solio"—this is a thing of the past.

Stereograms.—It stands to reason that records presenting the aspect of three dimensions afford much more information than pictures in two.

There are many conditions that are very difficult or impossible to show by an ordinary photograph that are perfectly clear in a stereogram; thus, among skin lesions, macules and flat papules are cases in point; varying muscle tonus as seen in facial palsy; surface protrusions, as in aneurysms and hernias, often quite unrecognizable in a flat picture, are shown in full relief in a stereogram. These facts are slowly receiving recognition in this country and the *Stereoclinic*, edited by Dr. Howard Kelly, as well as many European works stereoscopically illustrated, are evidences of a change in method that, I believe, is destined to be universal. The chief difficulty at the present time is in the matter of apparatus. The average stereoscopic camera is provided with short focus lenses and does not take objects nearer the camera than six feet. At this distance the scale of reduction is about $\frac{1}{20}$ and this is altogether too small to show skin conditions or small changes of contour. If the bellows length is increased and the object approached closer, the angle of divergence between the two images becomes so acute that they fall outside the limits of the plate. Some three years ago, I showed (*vide Camera Craft*) how this can be rectified by the addition of +2 spectacle lens and No. 6 prisms. With a Brownie Stereoscopic camera so modified, I take all my ordinary clinical photographs with ease and rapidity. I can take at any desired scale of reduction from $\frac{1}{20}$ to $\frac{1}{3}$ natural size. The resulting pictures can be viewed with a stereoscope, or, with a little practice, seen in relief by the unaided eye.



Clinical Record.
Hepatic Ascites—Scale $\frac{1}{10}$ th.

Autochromes.—Very few seem to realize the great advantages of the autochrome plate. Not only is it of value in such obvious conditions as those presented by diseases of the skin, but it is the best of all means for recording those subtle and often indescribable appearances to which we apply the term "cachexia." The kidney face, the dusky blush of diabetes, the difference between the capillary turgescence of a mitral lesion and the hectic of tuberculosis, the tint of Addison's disease as compared with other pigmentations, the tints of chlorosis and pernicious anemia, even the variations due to alteration in general health are recordable and may afford the most convincing of all demonstrations of the success of treatment. An

experience of autochrome work extending over hundreds of exposures from the time of the arrival of the first box of plates on this coast, has convinced me that a strict adherence to the directions of the makers as first promulgated offers the best means of success. The *sine qua non* of success in color photography is, first, always to work under fixed conditions; second, is always make two exposures and develop the second exposure in the light of the experience gained by the first. My best results are obtained by exposure in direct sunlight—3 to 6 seconds—and pyro-ammonia development. A new color plate made by the Paget Company offers the advantage of being more rapid and better for projection.

Photomicrographs.—The making of photomicrographs may not at present be a necessary part of the medical man's duties, but as we grow in the habit of relying on pathological data we shall more and more desire personally to interpret our material and keep records thereof. I am therefore tempted to endeavor to prove to all of you that the making of photomicrographs is a simple process, and to draw the attention of those members of the Society who are engaged in teaching histology and pathology to a new method of making photomicrographic slides for hand inspection and projection, that offers advantages over the regulation slide.

The average man who has read descriptions of the technic of making a photomicrograph is usually obsessed with visions of complicated apparatus which may be obtained for \$500 or so and still more complicated procedures to be applied to the same. The light has to pass through monochromatic-special filters for given stains. Illumination must be what is called "critical" and so on. All this is very nice and for certain lines of work possibly necessary. But I have here on the table (and some I will now project on the screen) 100 specimens of photomicrographs on glass of stained tissues, all the common organs and diseases under all kinds of staining and magnification, from 10 diameters to 1000, and they have all been made by uniting the tube of an ordinary microscope to an ordinary 5x7 camera by means of a piece of pasteboard that is not even light tight, and with no other illumination than that of an ordinary Tungsten incandescent bulb; often without a condenser. I will now set the apparatus up and will make the negative for a photomicrograph for you in the course of a few minutes. As to quality, the specimens here shown must be the answer. All that the best illustrations show are here present and many of these plates are indistinguishable from the microscopic fields of which they are the exact duplicates. I thus demonstrate to you that all of you can make photomicrographs with ease, and with everyday apparatus. The lantern slides made from these negatives are made by a modification of the Traube process described by me in *Camera Craft*.

I shall be happy to help any one desiring to use the same.

REPORT OF A CASE OF OIDIOMYCOSIS.*

By W. W. ROBLEE, M. D., Riverside.

Patient: Full-blooded Yuma Indian, age eighteen, reported at the morning clinic at the Sherman Institute Indian School, October 1, 1913. He complained of a sensitive spot over the outer side of the head of the left tibia; some swelling was present and no fluctuation. There was no history of an injury to the knee although he had been doing a great deal of running prior to the development of his disability. In other respects the boy was in good physical condition. So far as he remembered when questioned later, he had had no cough or other disability. He had always been a hearty, rugged lad. The knee was bandaged; he was advised to use it as little as possible and ordered to report regularly for observation. The soreness seemed to gradually increase; he was given a pair of crutches and kept at the hospital. A tentative diagnosis of tuberculosis of the affected part was made and he was placed on Syrup Ferrous Iodide internally.

He developed an irregular temperature and during the first week in January fluctuation was detected in the swelling. I made a small incision under ethyl chloride local anesthesia, expecting to evacuate a cold abscess, but very much to my surprise nothing but venous blood, both liquid and clotted, was discharged. The swelling became greater; there was a constant bloody oozing from the small opening and on January 6th, under general anesthesia, I made two free incisions over

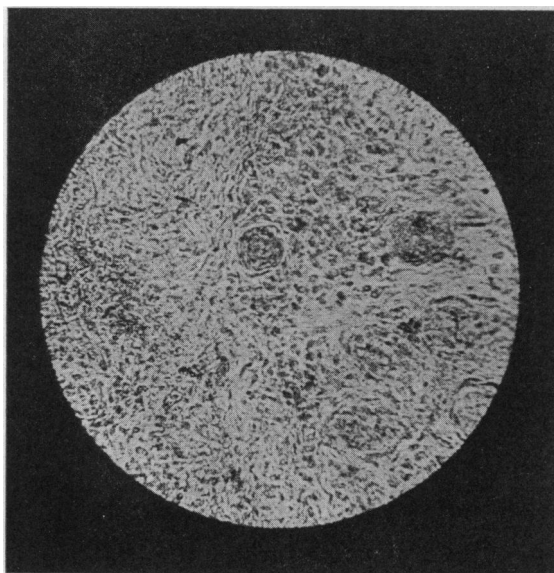


Plate I.

the head of the tibia. Large quantities of blood clots were scraped out with the gloved finger, a soft granulating mass was found subcutaneously but the bone was found not to be involved. At no point was the periosteum eroded. I packed the cavity and had no more free hemorrhage but there was, from that time on, a serosanguinous discharge from the wound. The edges of the linear incision on the outside of the leg gradually gave way until when last seen by me, there was a round ulcerated surface three by 2½ inches in diameter. About ten days later, a fluctuating mass developed in the right axilla and another over the left clavicle. These were incised; the axilla swelling contained blood clots, but the clavicular swelling contained creamy pus.

The boy was losing steadily in weight and was

* Read at the Forty-fourth Annual Meeting of the Medical Society, State of California, Santa Barbara, April, 1914.